

**NEMA Luminaire Section
Outdoor Lighting Task Force**

Recommended Model Outdoor Lighting Regulation

February 2003

I. Title:

Outdoor Lighting Regulation

II. Purpose:

The regulation promotes good lighting practice consistent with energy conservation, safety needs, and preservation of the natural night environment. The regulation defines the conditions under which State funding may be used to install or replace outdoor lighting. The principles embodied in this regulation to achieve those ends include the reduction of wasted light, glare, and trespass, and use of minimum appropriate light levels. The regulation achieves those ends by requiring lighting devices with improved light control while providing latitude for qualified professionals to provide a variety of solutions to lighting needs

III. Definitions:

In this regulation terms shall mean the following:

Luminaire: a complete lighting unit, often referred to as a “light fixture”. A luminaire consists of the lamp, optical reflector and housing, and electrical components for safely stating and operating the lamp.

Lamp: the component of a luminaire that produces light; the light source.

Lumen: a standard measure of luminous flux representing the quantity of visible light output.

Candela: a unit describing the intensity of a light source in a specified direction.

Nadir: the point directly below the luminaire defined as 0 degrees vertical angle.

Maintained Illuminance: the amount of light per square area required or recommended for a lighting application, taking into account losses over time between relamping and cleaning of the luminaire.

Outdoor Luminaire: any type of fixed or movable equipment that is designed or used for outdoor illumination. The term includes street lighting and area lighting. The term does not include lighting that is required to be installed on motor vehicles or lighting required for the safe operation of aircraft.

Full Cutoff Luminaire: a luminaire that allows zero candela at or above an angle of 90 degrees from nadir and candela at 80 degrees vertical angle above nadir that is no more than 100 per 1000 lamp lumens.

Energy Conservation: reducing energy costs and resources used, and includes using less luminaires and/or using luminaires with lower wattage consumption and using control technology to turn off or reduce wattage consumption of luminaires under appropriate circumstances.

Glare: light emitting from a luminaire that causes reduced vision or momentary blindness.

Light Pollution: the night sky glow caused by the scattering of artificial light in the atmosphere.

Light Trespass: light emitted by a luminaire that shines beyond the boundaries of the property on which the luminaire is located.

Qualified Lighting Professional: an Engineer or Lighting Designer trained in outdoor lighting design and a person certified as Lighting Certified (LC) by NCQLP.

[More detailed technical explanations and descriptions of some terms used may be found in the following documents issued by the Illuminating Engineering Society of North America (IESNA); IESNA Lighting Handbook, Ninth Edition, and IESNA Recommended Practice “Lighting for Exterior Environments” RP-33-1999].

IV. Standards for State-Funded Outdoor Lighting:

An outdoor luminaire may be installed or replaced using state funds only if:

1. The new or replacement outdoor luminaire is a full cutoff luminaire, or a luminaire that permits no more than 2% of the total luminaire lumens in the zone of 90 to 180 degrees vertical angle, if the rated output of the luminaire is greater than 3200 lumens;
2. The minimum average maintained illuminance adequate for the intended purpose is used, with consideration given to nationally recognized standards, including, but not limited to, recommended practices adopted by the Illuminating Engineering Society of North America (IESNA);
3. For lighting of a designated highway of the state highway system, the State Department of Transportation determines that the purpose of the outdoor luminaire cannot be achieved by the installation of reflective road markers, lines, warning or informational signs, or other effective passive means;
4. Full consideration has been given to energy conservation, reducing glare, minimizing light pollution, minimizing light trespass and preserving the natural night environment; and
5. When within a “dark area” that is designated by a state or local government body within a specified radius of an observatory, or as an intrinsically dark landscape area, the new or replacement outdoor luminaire is a full cutoff luminaire, if the rated output of the luminaire is greater than 3200 lumens.

V. Exemptions:

These requirements do not apply if:

1. A federal law, rule, or regulation preempts state law;
2. The outdoor luminaire is used only on a temporary basis by emergency, repair or construction personnel requiring additional illumination for emergency procedures or nighttime repairs or construction;
3. A compelling safety interest exists that cannot be addressed by another method, including lighting of areas of substantial nighttime pedestrian traffic, and where a qualified lighting professional has determined that the illumination requirements of the application require additional illumination or other types of luminaires;
4. The outdoor luminaire is used solely to enhance the aesthetic beauty of an object, structure or landscape;
5. A qualified lighting professional has determined, based on life cycle cost analysis, that such lighting is not cost effective;
6. The outdoor luminaire is used for the replacement of individual previously installed luminaires that are destroyed, damaged or inoperative; or

7. Special events or situations, including sporting events and the illumination of monuments, historic areas and structures or flags, may require additional illumination. Illumination for special events or situations must be installed to shield the outdoor lighting fixtures from direct view and to minimize upward lighting and light pollution.

VI. Effective Date:

This regulation takes effect one year after it becomes law and applies to outdoor luminaires installed or replaced, using state funds, after the effective date.